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काँच की परीक्षण नली — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

GLASS TEST-TUBE — SPECIFICATION

(Second Revision)

ICS 71.040.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 2006

Price Group 3

Glass, Glassware and Laboratoryware Sectional Committee, CHD 10

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Glass, Glassware and Laboratoryware Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1963 and subsequently revised in 1989. In this revision the tolerance on external diameter has been modified in Grade 1 test-tubes and wall thickness has been modified in both the grades. The requirement for annealing has been introduced. Marking clause has also been modified.

To assist the purchaser and the user of the test-tubes, the nominal capacity of different sizes is given in Annex A.

The composition of the Committee responsible for formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
GLASS TEST-TUBE — SPECIFICATION
(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for test-tubes used in chemical and bacteriological work in laboratories.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1382 : 1981	Glossary of terms relating to glass and glassware (*first revision*)
2303 (Part 1/Sec 1) 1994	Grading glass for alkalinity: Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C — Method of test and classification (*first revision*)
4905 : 1968	Methods for random sampling

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1382 shall apply.

4 TYPES

The test-tubes shall be of the following two types:

a) With rim, and
b) Without rim.

5 GRADES

5.1 The test-tubes shall be of the following two grades:

a) *Grade* 1, highly chemically resistant and suitable for most usual laboratory applications, withstand most temperatures commonly used, including boiling of samples, and
b) *Grade* 2, usually chemically resistant, suitable for less demanding applications, withstand moderate warming and not be subjected to severe thermal shocks.

5.2 Test-tube with rim is recommended for all purposes of heating and transfer of liquids.

6 REQUIREMENTS

6.1 Pattern

The pattern of test-tubes with rim and without rim shall be as illustrated in Fig. 1 and Fig. 2, respectively.

6.2 Material

The test-tubes shall be made of suitably annealed transparent glass not having any pronounced tint. They shall be appreciably free from stones, bubbles, striae, cords and other visible defects. Amber or other coloured glass may be used for special purposes.

6.2.1 *Grade* 1

Test-tubes shall be made from borosilicate glass having co-efficient of linear thermal expansion of $3.3 \times 10^{-6} °C^{-1}$ over a temperature range of 20 to 300°C. It shall also conform to Class HGB 1 of glass when tested according to the method prescribed in IS 2303 (Part 1/Sec 1).

6.2.2 *Grade* 2

Test-tubes shall be made from neutral glass conforming to Class HGB 1 of glass when tested according to the method prescribed in IS 2303 (Part 1/ Sec 1).

6.3 Construction and Finish

The test-tubes shall be regular in shape, uniform in thickness as far as possible and smoothly finished. They shall be symmetrical about the axes (*see* Fig. 1 and Fig. 2).

6.3.1 The bottom of the test-tubes shall be hemispherical in shape and the edges at the open end shall be smooth and properly rounded in flame.

6.4 Dimensions

The dimensions of Grades 1 and 2 test-tubes shall be according to Tables 1 and 2 respectively.

6.4.1 The rim diameter shall be 2 to 4 mm greater than the outer diameter of the test-tube.

6.5 Annealing

The test-tubes shall be sufficiently annealed to remove stresses. The maximum stress shall not exceed 1 750 kPa.

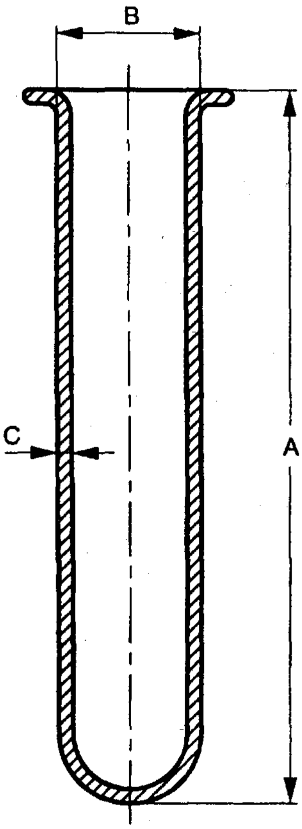

FIG. 1 TEST-TUBES WITH RIM

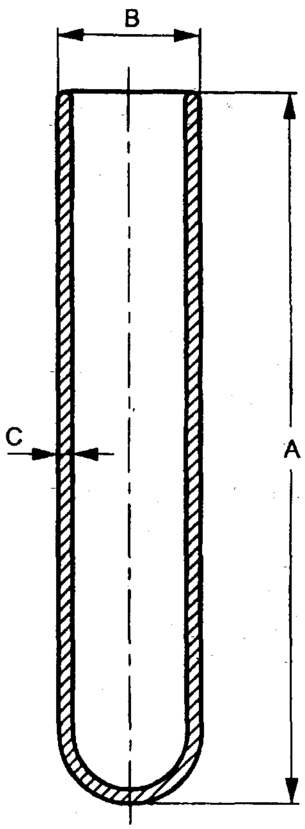

FIG. 2 TEST-TUBES WITHOUT RIM

Table 1 Dimensions for Grade 1 Test-Tubes
(*Clause* 6.4)

Sl No.	Nominal Size (OD × L) mm × mm	Length, *A* ± 3 mm	External Diameter, *B* mm	Wall Thickness, *C*	
				Light mm	Medium mm
(1)	(2)	(3)	(4)	(5)	(6)
i)	10 × 75	75	10 ± 0.5	0.9 ± 0.10	1.5 ± 0.15
ii)	12 × 75	75	12 ± 0.5	0.9 ± 0.10	1.5 ± 0.15
iii)	12 × 100	100	12 ± 0.5	0.9 ± 0.10	1.5 ± 0.15
iv)	15 × 125	125	15 ± 0.5	1.1 ± 0.10	1.8 ± 0.15
v)	15 × 150	150	15 ± 0.5	1.1 ± 0.10	1.8 ± 0.15
vi)	18 × 150	150	18 ± 0.5	1.1 ± 0.10	1.8 ± 0.15
vii)	25 × 150	150	25 ± 0.5	1.3 ± 0.15	1.8 ± 0.15
viii)	25 × 200	200	25 ± 0.5	1.3 ± 0.15	1.8 ± 0.15
ix)	32 × 200	200	32 ± 1.0	1.4 ± 0.25	2.0 ± 0.25
x)	38 × 200	200	38 ± 1.0	1.4 ± 0.25	2.0 ± 0.25

Table 2 Dimensions for Grade 2 Test-Tubes
(*Clause* 6.4)

Sl No. (1)	Nominal Size (OD × L) mm × mm (2)	Length, *A* ± 3 mm (3)	External Diameter, *B* ± 0.5 mm (4)	Wall Thickness, *C* ± 0.1 mm (5)
i)	10 × 75	75	10	0.6
ii)	12 × 75	75	12	0.6
iii)	12 × 100	100	12	0.6
iv)	15 × 125	125	15	0.7
v)	15 × 150	150	15	0.7
vi)	18 × 150	150	18	0.7
vii)	25 × 150	150	25	0.8
viii)	25 × 200	200	25	0.8

7 MARKING AND PACKING

7.1 Marking

7.1.1 Each test-tube shall be marked with the following:

a) Manufacturer's name or recognized trade-mark, if any;
b) Type and grade;
c) Size;
d) Month and year of manufacturing;
e) Batch/Lot number; and
f) A roughed surface or enamelled surface not less than 1 cm^2 for marking purposes.

7.1.2 *BIS Certification Marking*

Each test-tube may also be marked with the Standard Mark.

7.1.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7.2 Packing

The test-tube shall be packed as agreed to between the purchaser and the supplier.

8 SAMPLING

Representative samples of the test-tubes shall be drawn as prescribed in Annex B.

ANNEX A

(*Foreword*)

NOMINAL CAPACITIES OF TEST-TUBES

Nominal Size (OD × L) mm × mm (1)	*Approximate Capacity* ml (2)	*Nominal Size* (OD × L) mm × mm (3)	*Approximate Capacity* ml (4)
10 × 75	4	18 × 150	29
12 × 75	6	25 × 150	60
12 × 100	8	25 × 200	80
15 × 125	15	32 × 200	134
15 × 150	18	38 × 200	195

ANNEX B
(Clause 8)

SAMPLING OF GLASS TEST-TUBES

B-1 SCALE OF SAMPLING

B-1.1 Lot

All the test-tubes in a single consignment produced under similar conditions of the same type, grade and size shall be put together to constitute a lot.

B-1.1.1 In order to ascertain the conformity of the lot to the requirements of this specification, samples shall be tested from each lot separately.

B-1.2 The number of test-tubes to be chosen from the lot shall depend upon the size of the lot and shall be in accordance with col 2 and 3 of Table 3.

B-1.3 These test-tubes shall be chosen at random from the lot and in order to ensure the randomness of selection, the procedure given in IS 4905 may be followed.

B-2 CRITERIA FOR CONFORMITY

B-2.1 All these samples drawn in **B-1.3** shall be tested for construction finish and dimension. If the number of test-tubes failed to satisfy any of these requirements, it shall be termed as defective. The lot shall be declared as conforming to these requirements if the number of defectives is less than the number given in col 4 of Table 3.

B-2.2 If the lot satisfies the requirements given in **B-2.1** a sub-sample in accordance with col 5 of Table 3 shall be selected from the samples. All these samples thus selected shall be subjected to test for material. The lot shall be declared as conforming to this requirement, if none of the sample fails.

B-2.3 The lot shall be declared as conforming to this specification, if it satisfies **B-2.1** and **B-2.2**.

Table 3 Number of Test-Tubes to be Selected for Sampling
(*Clauses* B-1.2, B-2.1 *and* B-2.2)

Sl No. (1)	Lot Size (2)	No. of Samples (3)	Acceptance No. (4)	Sub-sample (5)
i)	Up to 150	13	1	2
ii)	151-300	20	1	3
iii)	301-500	32	2	4
iv)	501-1 000	50	3	5
v)	1 001 and above	80	5	6

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Glass, Glassware and Laboratoryware Sectional Committee, CHD 10

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